

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JAY A. DICKERSON, HARRY J. GOLDY, DOUGLAS C. SMITH
and RONALD R. STAIB

Appeal No. 1997-3118
Application No. 08/372,083

ON BRIEF

Before OWENS, LIEBERMAN and TIMM, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of claims 1-6, 9-30 and 33-50, which are all of the claims remaining in the application.

THE INVENTION

Appellants' claimed invention is directed toward a process for preparing an aqueous papermaking suspension from a pulp containing surface active carboxyl compounds, and toward the paper made from this suspension. Claim 1 is illustrative:

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1. A process for preparing an aqueous papermaking suspension containing pulp fibers and a polyelectrolyte complex, comprising:

a) providing an aqueous suspension comprised of pulp fibers and surface active carboxyl compounds;

b) adding to the aqueous suspension a water-soluble cationic polymer and a water-soluble anionic polymer that are reactable in the aqueous suspension to form the polyelectrolyte complex, and a compound containing a multivalent cation having at least a +3 charge; and

c) forming the polyelectrolyte complex;
wherein said compound containing a multivalent cation is added at a level such as to provide an amount of cation equivalent on a molar basis to the amount of aluminum present in alum added at a level of from about 1.5% to about 6% based on the dry weight of pulp fibers.

THE REFERENCES

Economou 1972	3,660,338	May 2,
Strazdins 1977	4,002,588	Jan. 11,
Smith 1990	0 362 770	Apr. 11,

(European patent application)

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Derwent abstract no. 86-277082/42 (Sept. 1986) of Netherlands patent publication 8500507 to Smulders, published Sept. 16, 1986 (NL '507).¹

¹ The examiner has not provided and relied upon an English translation of NL '507. Thus, our decision is based upon the English abstract of this reference.

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THE REJECTION

Claims 1-6, 9-30 and 33-50 stand rejected under 35 U.S.C. § 103 as being unpatentable over Smith in view of Strazdins, Economou or NL '507.

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with appellants that the aforementioned rejection is not well founded. Accordingly, we reverse this rejection.

Smith discloses a process for preparing an aqueous papermaking suspension containing pulp fibers and a polyelectrolyte complex (page 1, lines 1-3; page 3, lines 2-3). The pulp is unbleached pulp (page 3, lines 39-40 and page 3, line 46 - page 4, line 2) which, appellants indicate (specification, page 2, line 26 - page 3, line 3), normally contains surface active carboxyl compounds at levels sufficient to interfere with the performance of strength enhancing additives. Smith's polyelectrolyte complex is formed from water soluble cationic and anionic polymers which, appellants state (specification, page 8, lines 2-6), are their

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preferred polymers. Smith does not disclose appellants'
recited multivalent cation.

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Appellants' most preferred multivalent cation is aluminum, particularly aluminum supplied by alum (specification, page 13, lines 1-3).

Strazdins discloses making paper having good strength without the need for alum by adding to unbleached pulp 1) a polysalt composed of specified water insoluble anionic and water soluble cationic polymers, and 2) an ionization suppressor (i.e., an acid which has a pH of less than 3 and is compatible with the polysalt) (col. 1, lines 57-58; col. 1, line 66 - col. 2, line 2; col. 2, lines 3-20 and 48-56; col. 4, lines 27-39). "The [polysalt-ionization suppressor] compositions can be successfully added to furnishes which contain alum in normal amount and which thus have a pH in the range of 4-6. This secures the full benefit of the alum present and incorporates alum into the paper, and when one or both of the polymers carries aldehyde thermosetting substituents, best wet strength is obtained" (col. 5, lines 16-46). Appellants indicate that the amount of alum normally used with unbleached pulps is less than 1% (specification, page 4, lines 13-15), and in Strazdins' examples the amount used is 1% (col. 7, line 4; col. 9, line 61).

The examiner argues that "Strazdins teaches that the addition of alum is beneficial for improving the strength imparted to paper by the polysalt or polyelectrolyte complex" (answer, page 4). What Strazdins, teaches, however, as indicated by the excerpt cited above, is that the polysalt secures the full benefit of the alum and incorporates it into the paper. Strazdins' examples 3 and 8, relied upon by the examiner as teaching that alum improves the paper strength (answer, page 5), show that paper made from an unbleached pulp containing 1% alum has a particular strength. Neither these examples nor the above-cited excerpt indicate that increasing the amount of alum would increase the paper strength. Moreover, Strazdins uses cationic and anionic polymers (col. 2, lines 3-18; col. 3, lines 3-20) which have specific properties and are different from those used by Smith (page 3, lines 7-41). The examiner argues that Smith is an improvement over Strazdins (answer, page 5), but does not explain why one of ordinary skill in the art would have considered the teaching of Strazdins regarding the combined use of his cationic and anionic polymers and alum to be applicable to the

combination of alum with Smith's cationic and anionic polymers.

Economou discloses liquid water insoluble polysalt coacervates formed by mixing a dilute aqueous solution of an anionic polyelectrolyte with a dilute aqueous solution of a cationic polyelectrolyte, and teaches that the coacervates are "dry-strength agents which can be self-adsorbed by cellulose fibers in aqueous suspension and which consequently do not require the addition of alum or other fixing agent" (col. 1, lines 31-35; col. 2, lines 64-67). Economou, however, provides examples where the polysalts are used in aqueous suspensions of bleached fibers containing up to 2% alum based on the dry weight of the fibers (col. 9, lines 21-40; col. 12, lines 40-56). In these examples the paper dry strength increases as the alum is increased to 0.5 wt%, and then decreases as the amount of alum is further increased.

The examiner argues that Economou "teaches that the addition of alum improves the strength imparted to paper by the polysalt formed by the addition of cationic and anionic polymers to a pulp slurry" (answer, page 4). Economou, however, does not disclose use of unbleached pulp. The

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examiner does not establish that the bleached pulp used by Economou contains the surface active carboxyl compounds required by appellants' claims or explain why, if the pulp does not contain such compounds, one of ordinary skill in the art would have had a reasonable expectation of success in applying Economou's process to an aqueous suspension containing them. See *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). Also, Economou's anionic and cationic polymers (col. 5, lines 17-54) are different than those used by Smith (page 3, lines 7-41). The examiner does not explain why one of ordinary skill in the art would have reasonably expected Economou's teaching regarding the use of alum with his anionic and cationic polymers to apply to the use of alum with Smith's anionic and cationic polymers. Thus, the examiner's argument that Smith and Economou would have fairly suggested, to one of ordinary skill in the art, adding an amount of alum to Smith's suspension which improves paper strength (answer, page 5) is not persuasive.

NL '507 discloses use of cationic starch as a paper strengthening agent and teaches that neutralizing anionic materials with polyvalent cations from compounds which can be alum prevents the anionic materials from complexing with the cationic starch and thereby rendering it inactive.

The examiner argues that NL '507 "teaches that it is advantageous to add alum to the pulp to neutralize the anionic trash which is the source of of [sic] the claimed surface active carboxyl impurities derived from pulping prior to the addition of cationic polymer (cationic starch) and a retention aid (anionic polyacrylamide) in order to improve the strength of the paper product" (answer, page 4). The examiner, however, does not explain how, if the anionic materials are prevented from complexing with the cationic starch, appellants' recited polyelectrolyte complex is obtained. Also, the examiner does not explain why NL '507 would have indicated to one of ordinary skill in the art that the disclosure therein would be applicable to Smith's anionic and cationic polymers, and why the amount of alum used to neutralize Smith's anionic polymer would be within the scope of appellants' claim 1. NL '507 does not teach that the alum

increases paper strength but, rather, teaches that the cationic starch increases paper strength and that the alum prevents the cationic starch from being rendered inactive by complexing with the anionic materials. Appellants argue that the amount of AlCl_3 in the NL '507 example is equivalent to only 0.2% alum based on pulp (brief, page 8), and the examiner does not respond to this argument.

Regarding claims 49 and 50, which recite paper made by the processes recited, respectively, in claims 3 and 27, the examiner does not explain why the applied prior art would have led one of ordinary skill in the art to add an amount of alum to Smith's suspension such that paper is produced which reasonably appears to be the same or substantially the same as the paper prepared by these processes.

For the above reasons we conclude that the examiner has not carried the burden of establishing a *prima facie* case of obviousness of appellants' claimed invention.

DECISION

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The rejection of claims 1-6, 9-30 and 33-50 under 35
U.S.C. § 103 over Smith in view of Strazdins, Economou or NL
'507 is reversed.

REVERSED

TERRY J. OWENS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
PAUL LIEBERMAN)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
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)	
CATHERINE TIMM)	
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